Genetic and phenotypic insights in the adaptation of Magnaporthe oryzae to rice

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Magnaporthe oryzae is the fungal pathogen causing rice blast. Rice resistance is commonly used to control this widely distributed and damaging disease of a major food crop. Pathogen adaptation to its host is illustrated by frequent events or resistance breakdown after deployment of resistant cultivars. Cloning of resistance genes and of their corresponding avirulence genes provide a unique opportunity to document how resistance breakdowns occurred and to try to imagine how they could be avoided in the future. On the basis of genetic data, we will present several examples of evolution of avirulence genes and try to propose from these case studies some general assumptions on the pathogen adaptation. In addition, based on phenotypic characterization of interactions and population genetics of the pathogen, we will show evidences of a longer coevolution process that leaded to specialization on different rice genetics groups.